

# **Port Expansion Issues**

**U.S. Maritime Administration  
Workshop on  
Maritime Energy and Clean Emissions**

**January 29, 2002  
T.L. Garrett  
Port of Los Angeles**

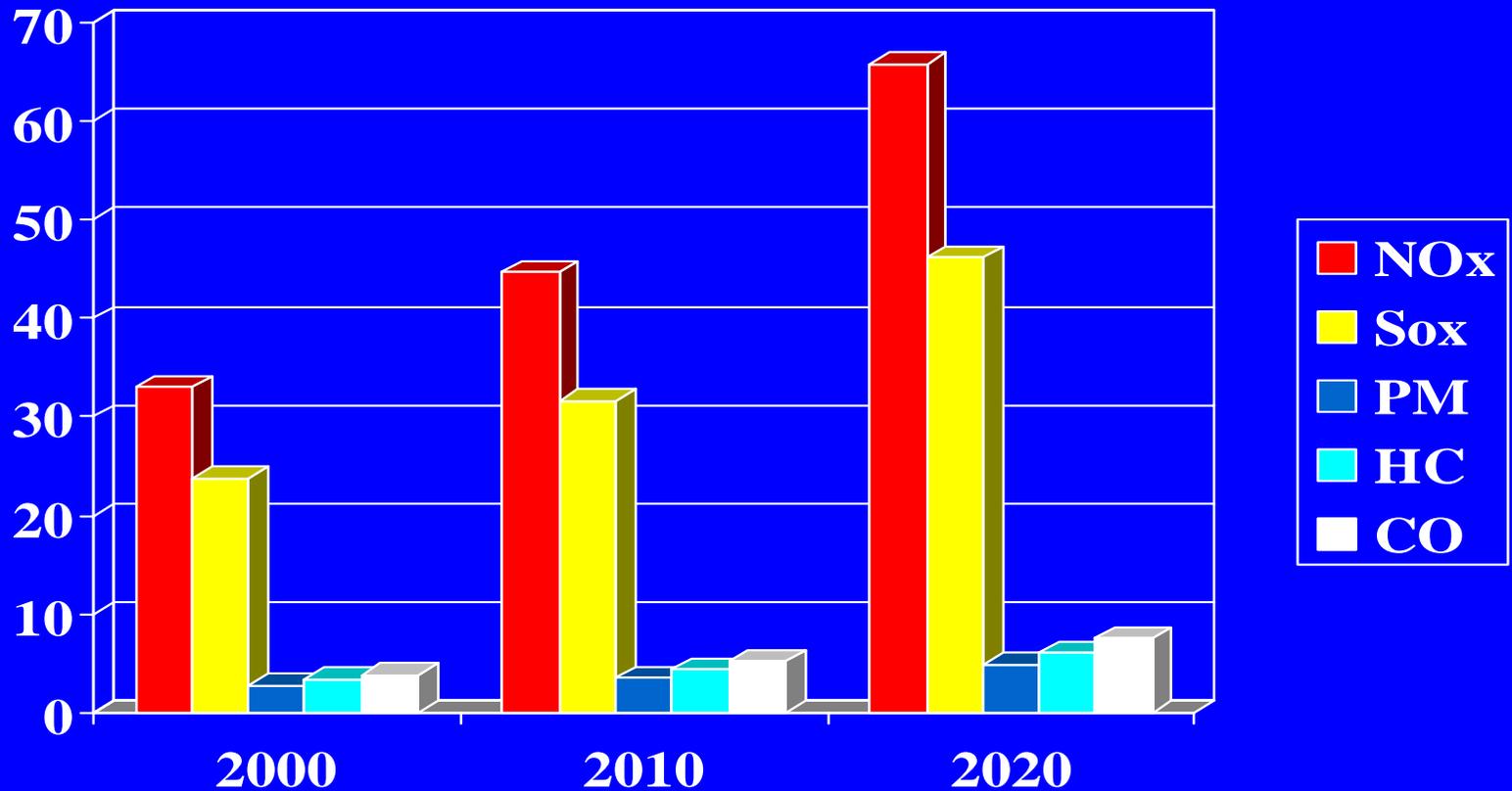


# **Board Policy**

## **“No Net Increase”**

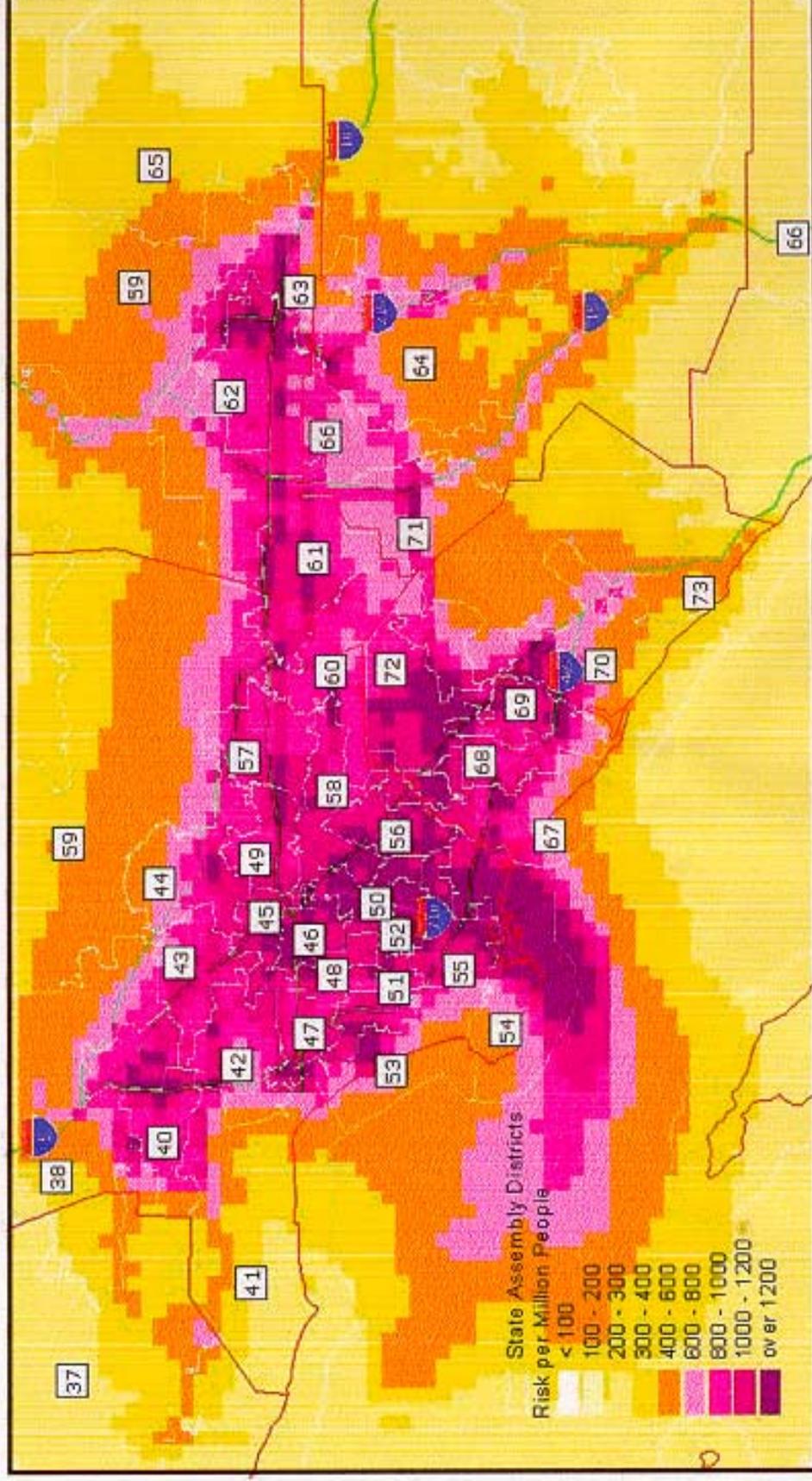
- **Cargo Throughput Projected to Triple by 2020**
- **Challenge to Handle Cargo while Maintaining/Improving Air Quality and Traffic Congestion**

# Marine Vessel Emissions (tons/day)



# Diesel Air Toxics/MATES II

## Model Estimated Risk From All Emission Sources



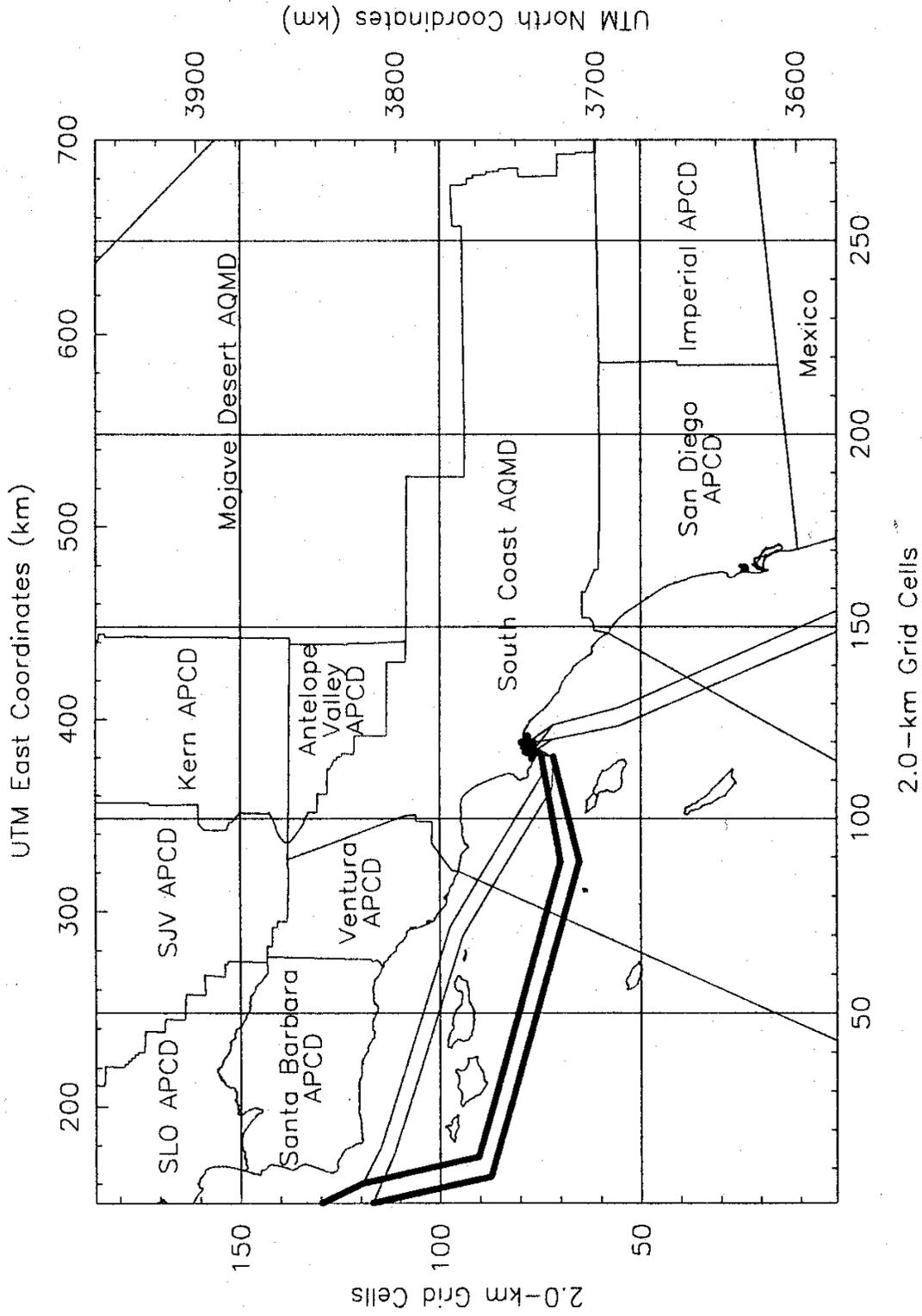
# Vessel Emissions



# Vessel Operational Controls

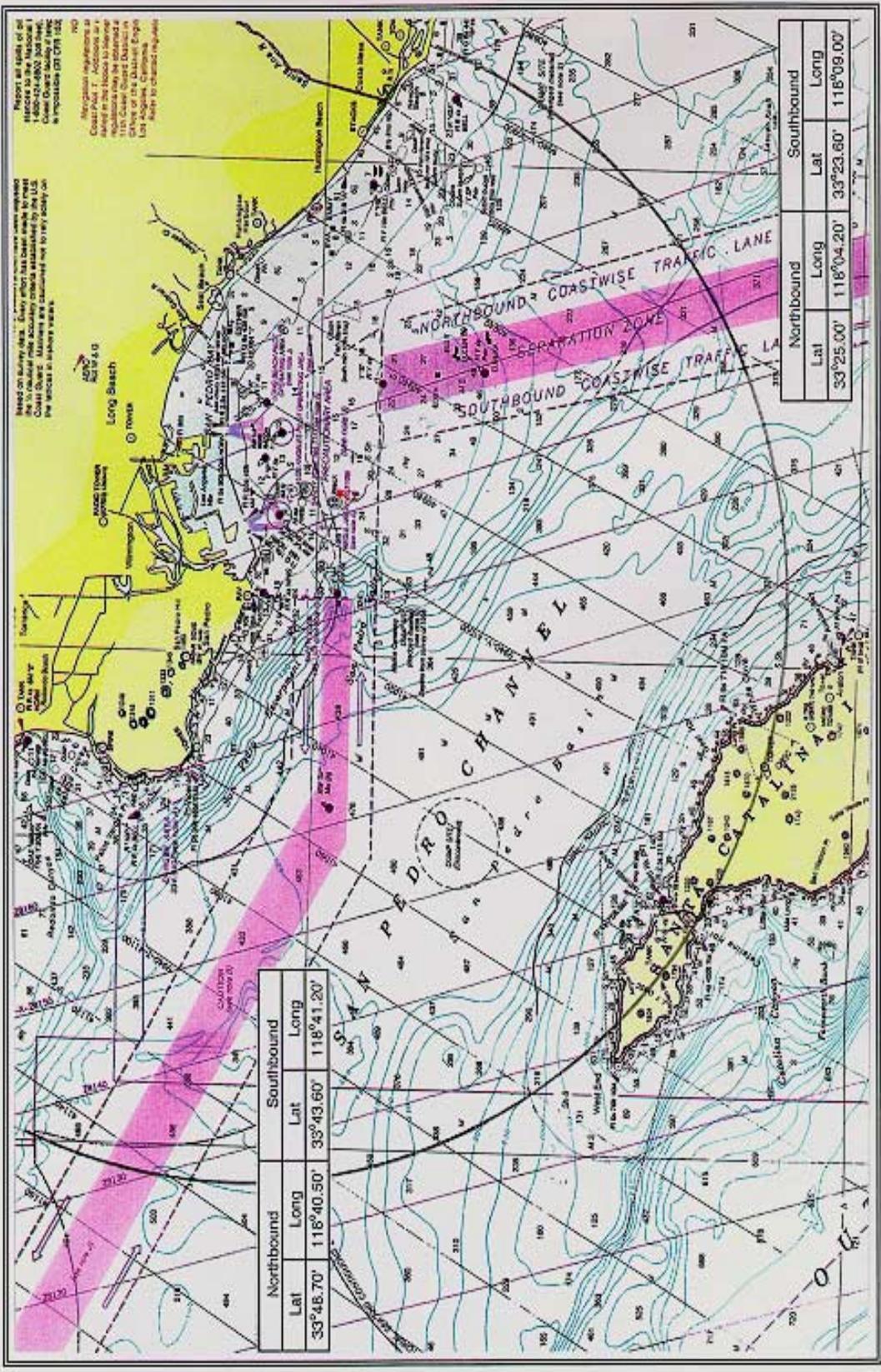


# Existing and Proposed Shipping Channels



# Vessel Speed Reduction

Air Quality Compliance Zone  
12 Knots at 20 Nautical Miles From Point Fermin

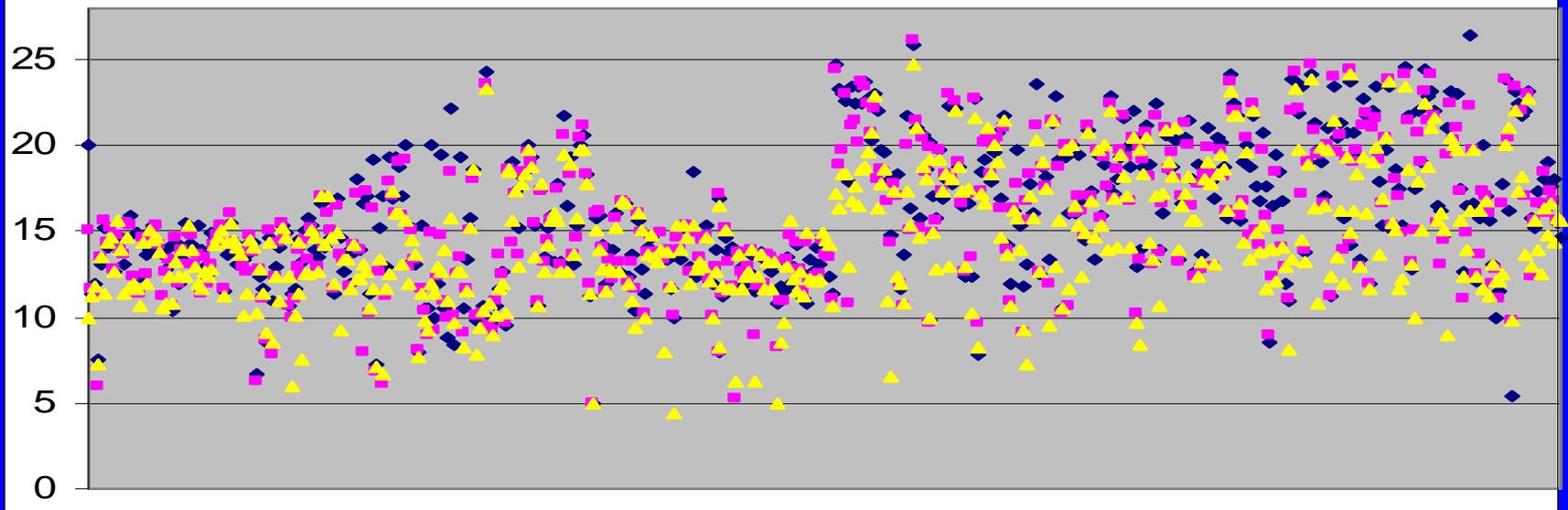




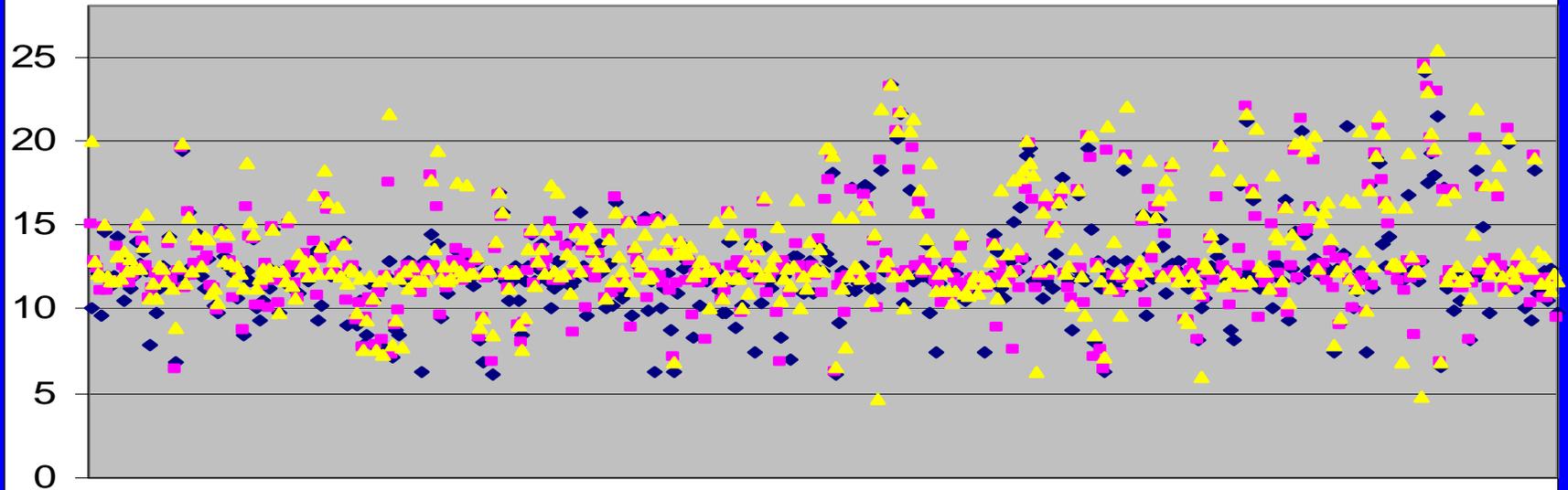
# VSR Results

- **Six Months of Data**
  - Appx. 2800 ship calls
  - Appx. 460 per month
- **Container vessels > 50 %**
  - Appx. 1400 ship calls
  - Appx. 240 per month

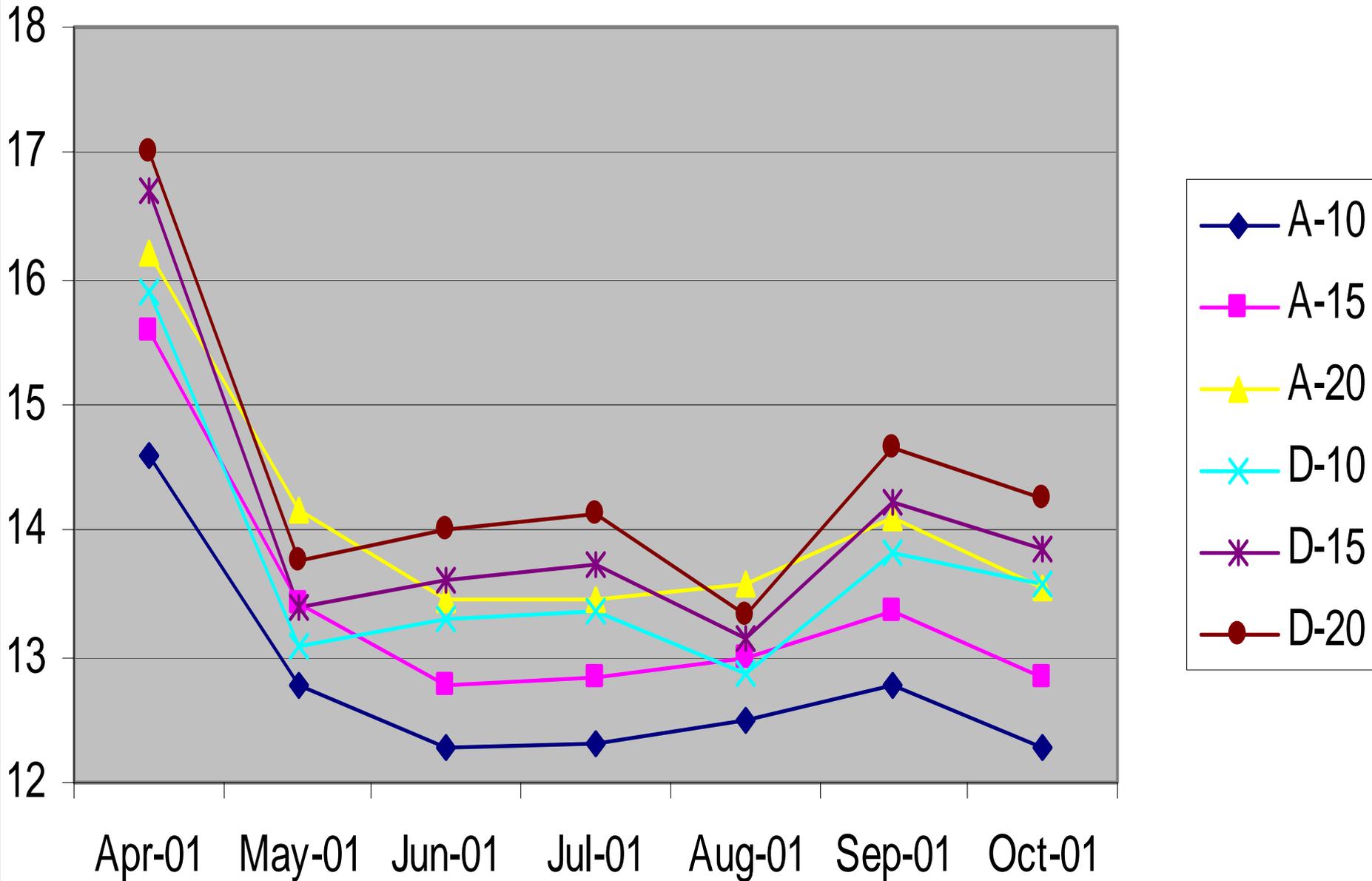
# Vessel Speed (nm/hr) April 2001



# June 2001



# Average Ship Speeds (nm/hr)



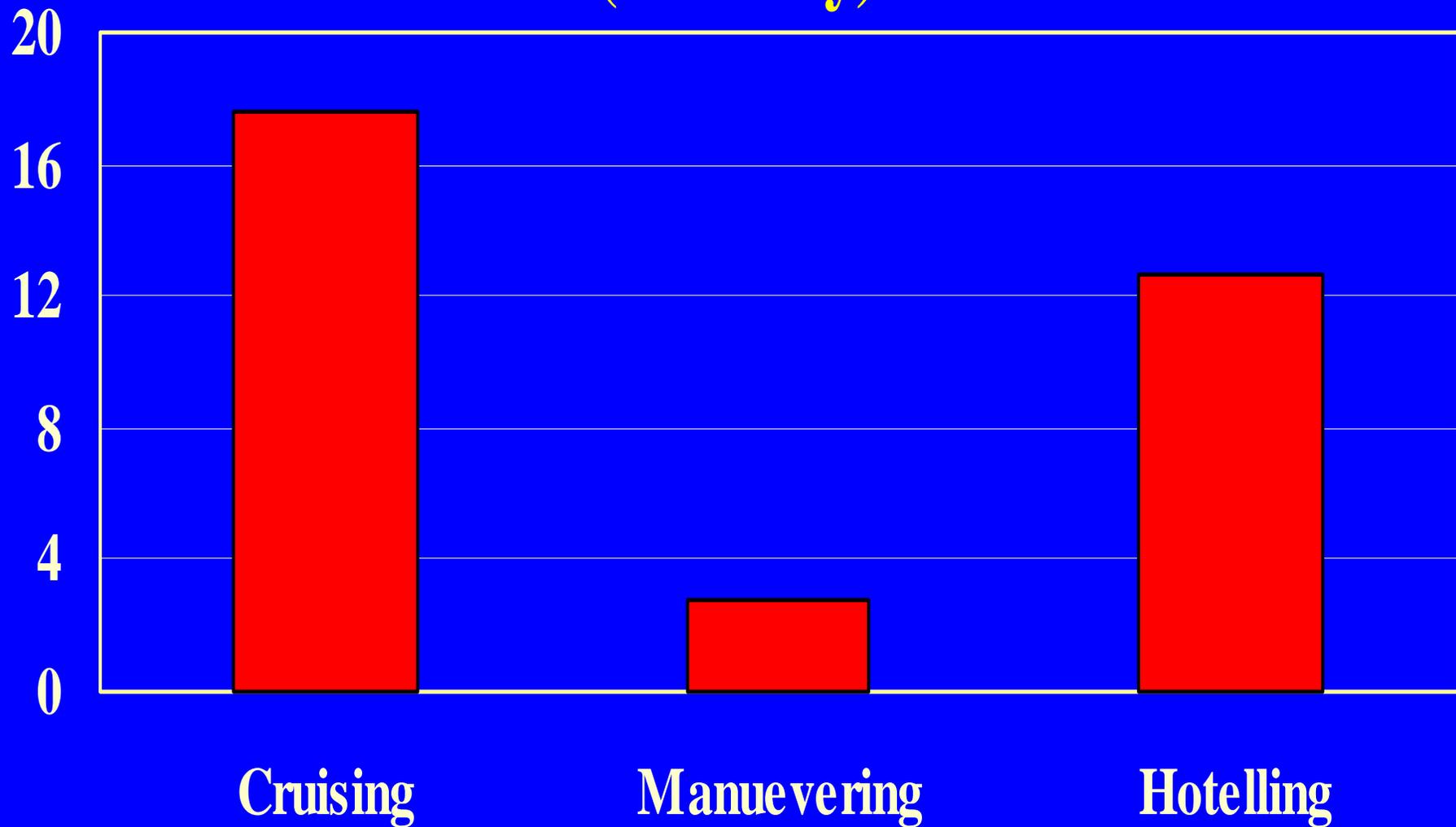
# VSR Summary

- **VSR Measure is Working  
but Could & Should do Better**
  - **Improve Outreach/Education**
  - **Provide Incentives**
- **Calculation of Emissions Benefits  
will require SIGNIFICANT EFFORT**

# Hotelling Vessels



# 2000 Ship NO<sub>x</sub> Emissions by Mode (tons/day)



# Terminal Infrastructure





# Support Craft



# Repowers



# On-Dock Equipment



# Technologies Considered

- **Gaseous Fuels (CNG, LNG, LPG)**
- **Liquid Fuels**
  - **Low Sulfur Diesel Fuel (15 ppm)**
  - **Water / Diesel Emulsifications**
  - **Bio – Diesel**
  - **Gas to Liquid**
- **After Combustion Retrofits**
  - **Particulate Traps**
  - **Oxidation Catalyst**
- **Fuel Cells?**

# POLA Alternative Fuel Program



# Propane Yard Tractors



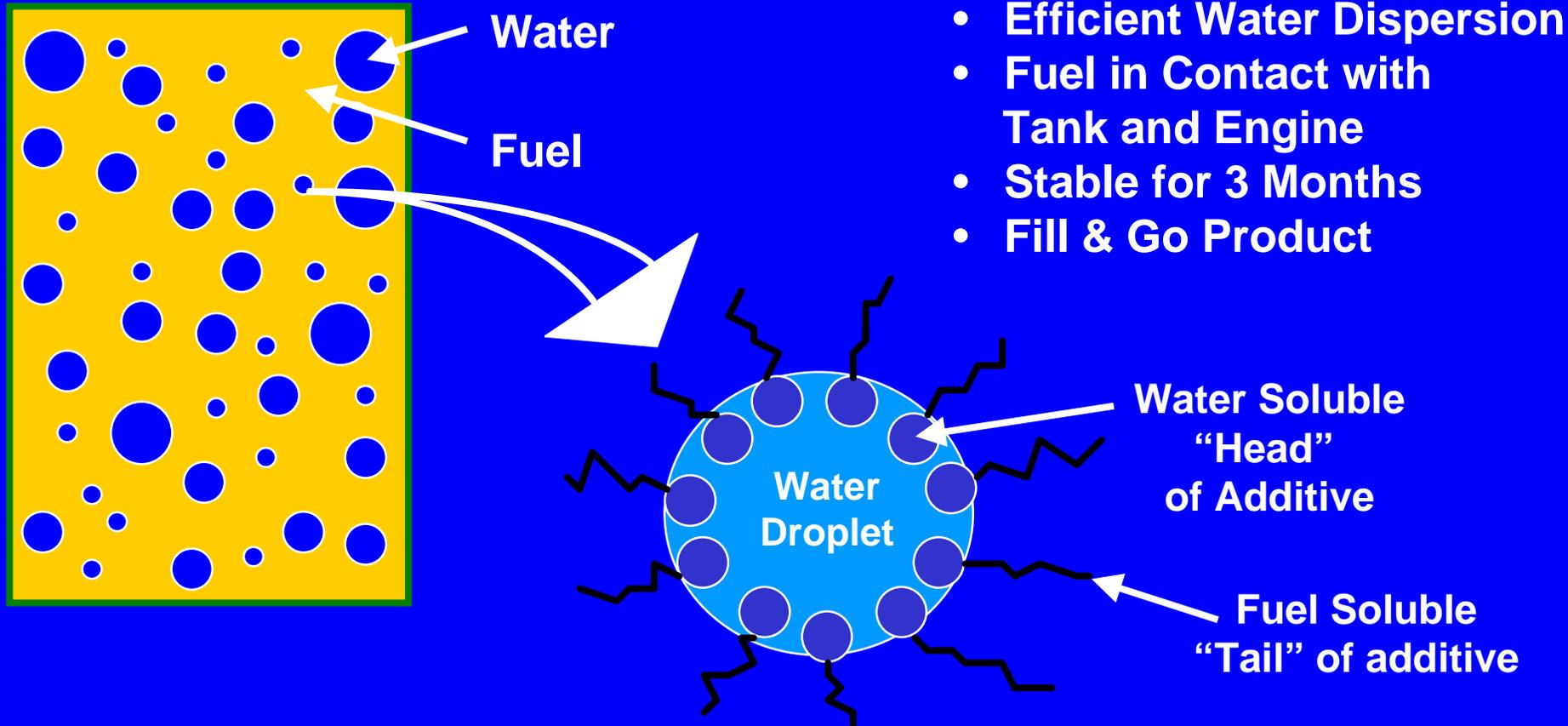
# Diesel On-Dock Equipment



# PuriNOx™ Fuel



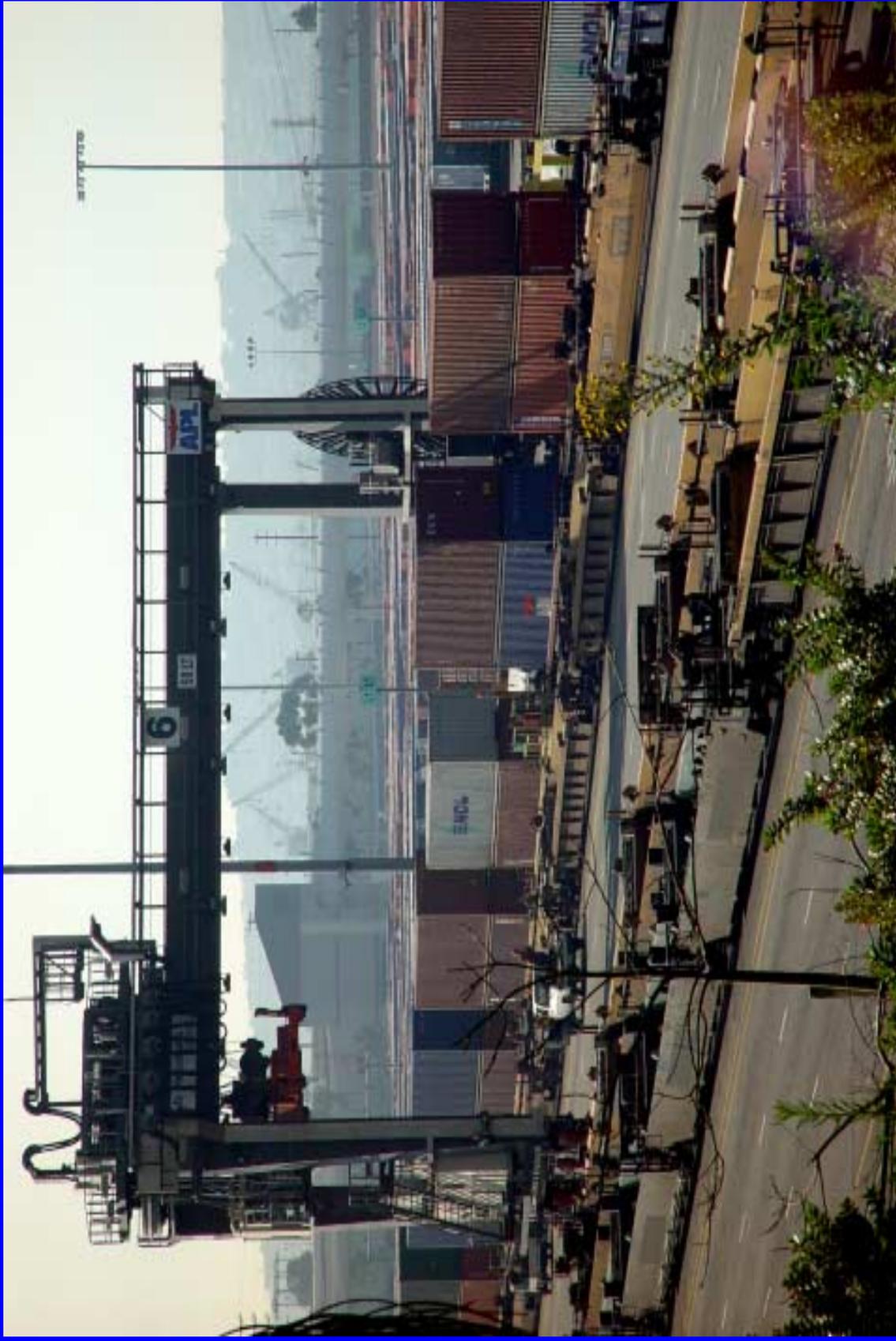
- ARB verified: 14% NOx and 63% PM reduction



# Diesel Oxidation Catalyst



# Electrification of On-Dock



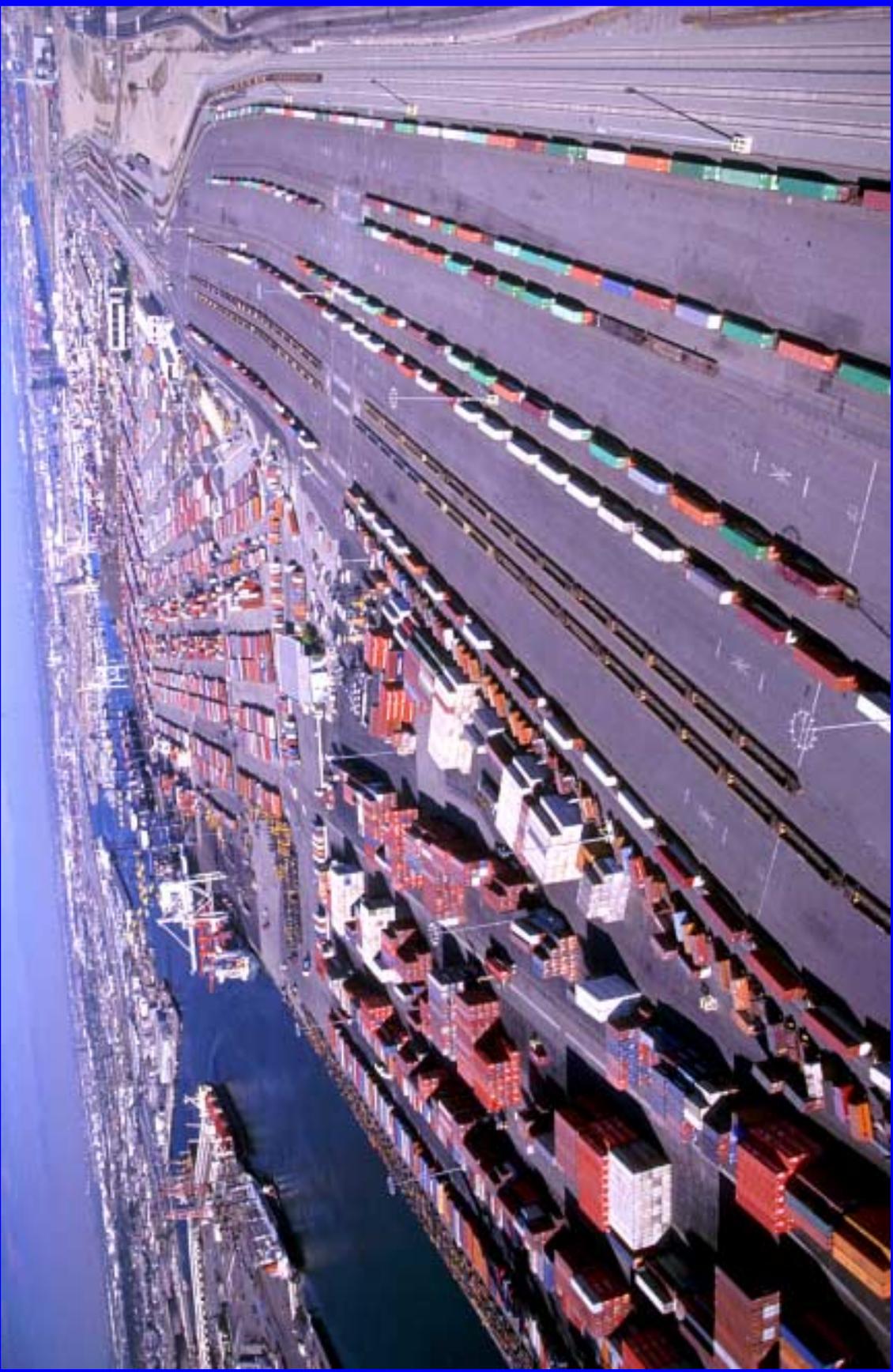
# On-Road Trucks



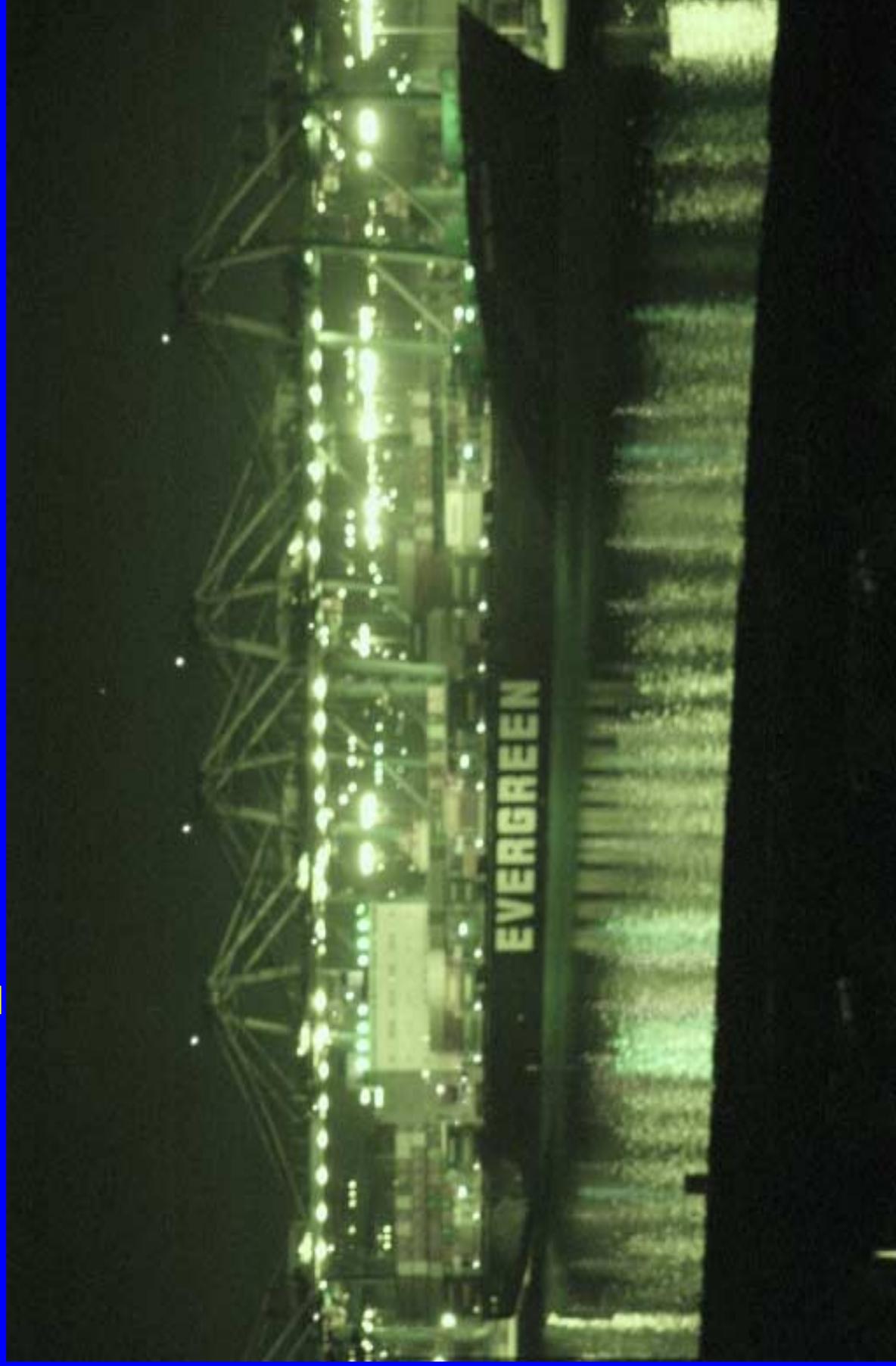
# Near Dock Rail



# Container Rail Yards



# Expanded Schedule



# **“No Net Increase” Achievable?**

- **Define the Baseline**
- **Build in Operational Efficiencies**
- **Account for Regulatory Measures**
- **Take Advantage of New Technologies**
- **Develop Incentive Programs**

